The crocodiles are skinned, taking all but the bony dorsal strip, and the skins fleshed, salted and stacked, then dried and folded two days later. These are then offered to hide agents at the ruling price per inch across the belly.

The aboriginal has now entered this commercial field on his own account, spearing the crocodiles and selling the skins through the church missions.

White men now consider crocodile hunting does not warrant the overhead.

General: Crocodiles are extremely shy, and although they will approach to within feet of a perfectly still observer, they immediately retreat at the slightest movement. When a surfacing crocodile dives it draws it head back diagonally with the minimum water disturbance. Disturbed on a bank, the reptile may reach the water by three methods of progression: If there appears to be no immediate danger the water is reached with a slow waddling gait, but when alarmed on a hard bank some distance from the river the body and tail are raised from the ground and with an amazing turn of speed the crocodile races for the water. Where the banks are soft mangrove mud, the mud is used as a slide.

Small crocodiles are occasionally seen stretched on limbs overhanging a river. This does not mean that crocodiles can climb trees. In parts of the north the tide may rise and fall twenty feet or more, with the result that small crocodiles resting on submerged limbs at high tide may be left dry when the tide drops.

Crocodile eggs and crocodile flesh is a staple diet with the aborigines.

Melville Island natives say the scutes are beautification scars, while other tribes say they are caused by mythological battles.

The Australian Crocodile Shooters' Club, a game shooting organisation, is now considering limiting the sizes of crocodiles shot in order to conserve the rapidly dwindling species.

★

FIGURES OF SOME AUSTRALIAN FISH TYPES

By Gilbert P. Whitley, f.r.z.s.

(Contribution from The Australian Museum)

(Figures 1-8)

Practically all of the species dealt with in this paper have not been illustrated before, so figures have been prepared from typical specimens.

Family CARANGIDAE

DECAPTERUS LEPTOSOMUS Ogilby

(Figure 1)

Decapterus leptosomus Ogilby, Proc. Linn. Soc., N.S. Wales, xxii, 4, 1898, p. 760. Port Jackson, N.S. Wales. Cotypes in Australian Museum.

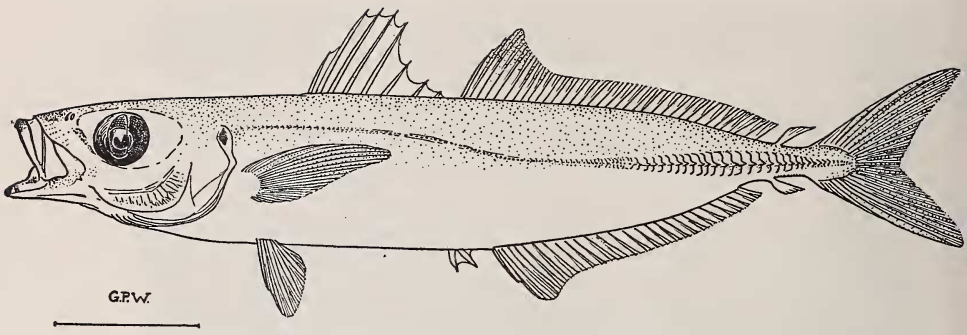

Figure 1.—Scad, *Decapterus leptosomus.* Lectotype, Australian Museum.

Here figured from the lectotype of the species, the larger of two cotypes, a specimen 152mm. in length to caudal fork. Austr. Mus., regd. no. 1.4362. It has D.viii/i, 34; A.ii/i, 27; P.23; L.Lat. circa 83 scales and 27 scutes.

Family LUTJANIDAE

LUTJANUS CASTELNAUI Whitley

(Figure 2)

Lutjanus castelnaui Whitley, Rec. Austr. Mus., xvi, 1928, p. 215. New name for *Genyoroge unicolor* Alleyne & Macleay, 1877, anticipated by *Neomesoprion unicolor* Castelnau, 1875, another species of *Lutjanus.*

Here illustrated from the lectotype of the species, a specimen 210mm. in standard length, from the Percy Islands, Queensland. It was kindly lent by the Curator of the Macleay Museum, University of Sydney, for this purpose.

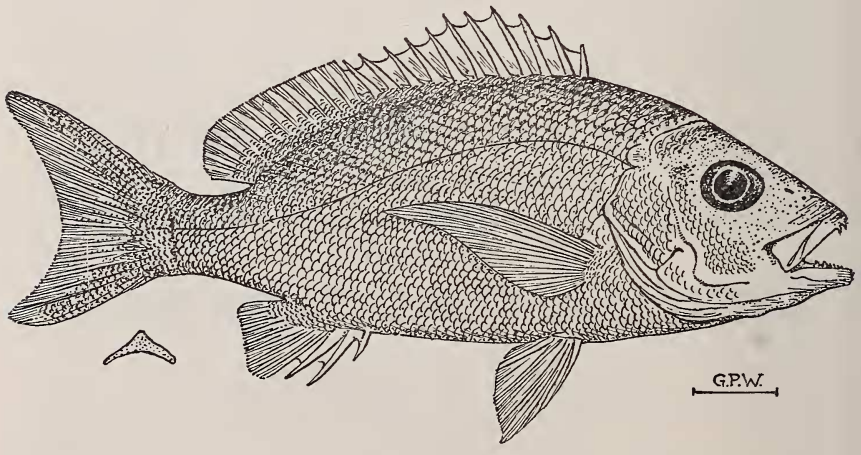

Figure 2.—Hussar, *Lutjanus castelnaui.* Lectotype of *Genyoroge unicolor,* Macleay Museum. Inset, vomerine teeth.

LUTJANUS LONGMANI Whitley

(Figure 3)

Lutjanus longmani Whitley, Rec. Austr. Mus., xx, 1937, p. 12. Off Lindeman Island, Queensland.

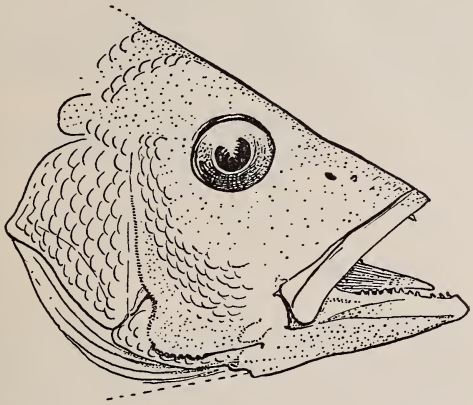

Figure 3.—Hussar, *Lutjanus longmani.* Head of holotype, Austr. Mus.

Figured here from the holotype in the Australian Museum; regd. no. IA.6584.

Family GOBIIDAE

INNOCULUS, gen. nov.

Orthotype, *Gobius nigroocellatus* Gunther, as identified here. D.vi/11; A.10; Sc. 26 to 28; Tr. 8.

Head bluntly rounded, longer than broad, and broader than deep.

Eyes fairly large, without cirrhus above. Interorbital narrow.

Head with loose (especially around lower jaws) skin, crossed by some rows of minute sensory papillae. Chin without barbels. Cheeks and opercles naked. Nape and top of head scaly, without crests. Mouth extending to below middle of eye. Teeth villiform, in bands on jaws, some outer ones enlarged (but not canine), hook-like, erect, movable. None on lips, vomer or palatines. Tongue broadly convex, not notched, not adnate. Jaws subequal or upper slightly overhanging lower. Nostrils subcircular, before eyes. No occipital crest.

Few slender, weak gill-rakers. No pit above the opercle. Preopercle unarmed. Gill-openings little wider than depth of pectoral base; isthmus fairly broad.

Form rather elongate, compressed. Body opaque with large ctenoid scales which extend over breast, pectoral base and top of head. Exposed edge of shoulder-girdle without fleshy lobes.

Dorsal fins separate: sixth dorsal spine rather remote from others; middle spines longest. No produced spines or rays. Soft dorsal and anal fins, free from caudal, the latter rounded.

Ventrals united, not adnate to belly, fifth rays longest.

Infundibulum moderate. Upper pectoral rays free, silk-like; the fin rather pointed and about as long as head.

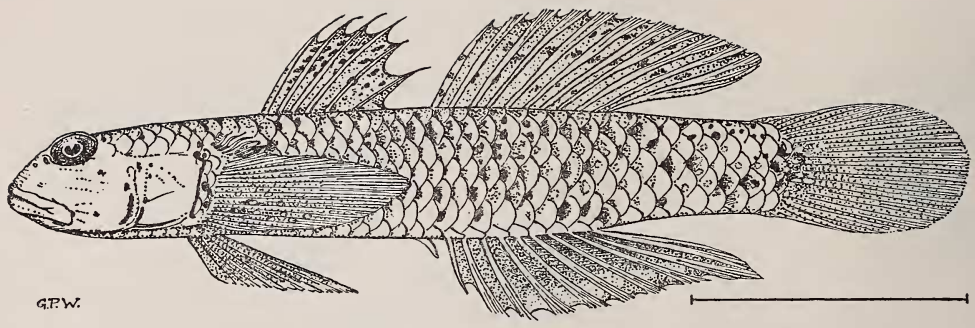

Figure 4.—Goby, *Innoculus nigroocellatus*. Pleisotype, Austr. Mus.

Colour dark brown with blackish spots on body. Length to about 3½ inches.

Allied to the genus *Gobius* of authors in the broadest sense, but differs from *Gobius* (*niger*) Linne, in the strict sense, in being smaller, in having much longer body, yet fewer dorsal and anal rays, and larger scales with longer, more converging radii and granular rather than striated field.

European and Australian specimens of the two genotypes compared.

The word *innoculus* has no meaning (see Savory, Browsing Among Words of Science, 1951, the last word in his book). Then let it at least mean this harmless, innocent little goby, black-spotted though it be.

INNOCULUS NIGROOCELLATUS (Gunther)

(Figure 4)

Gobius nigroocellatus Gunther, Journ. Mus. Godeffroy, i, 2, 1873, p. 101. Bowen, Queensland. Type in British Museum (Nat. Hist.). Seen in 1937. *Id.* Macleay, Proc. Linn. Soc., N.S. Wales, v, 1881, p. 603, and Cat. Austr. Fish., i, 1881, p. 238 (English trans. of original German description). *Id.* McCulloch and Ogilby, Rec. Austr. Mus., xii, 1919, p. 230. *Id.* McCulloch and Whitley, Mem. Qld. Mus., viii, 1925, p. 171.

Here figured from one of several specimens collected by Rev. W. S. Chaseling in 1939 from the Melville Bay and Cape Arnhem areas (Austr. Mus., regd. no. IB.422). New record for the Northern Territory of Australia. Hitherto known only from Gunther's type from Bowen, Queensland.

Genus NESOGOBIUS Whitley, 1929

Nesogobius Whitley, Proc. Roy. Soc. Tas., 1928 (1929), p. 62. Orthotype, *Gobius hinsbyi* McCulloch and Ogilby. *Id.* Scott, *ibid,* 1934 (1935), pp. 47 and 60; *et ibid,* 1938 (1939), p. 157.

NESOGOBIUS PULCHELLUS (Castelnau)

(Figure 5)

Gobius pulchellus Castelnau, Proc. Zool. Acclim. Soc., Vict., i, 1872, p. 125. Westernport, Victoria. And of later Australian lists. *Id.* Koumans, Zool. Med., xxii, 1940, p. 162, but not the species on p. 171.

General characters as described for the genotype, *hinsbyi*, by McCulloch and Ogilby (Rec. Austr. Mus., xii, 1919, p. 215, pl. 33, fig. 1), but scales

fewer, lacking on head, form less slender, spinous dorsal elevated and dark anteriorly, body not barred, and differing in various other details as described below.

Br. 7. D. vii/i, 10; A. 2, 8; P. 17; V. i, 5; C. 12 branched rays.

About 25 rows of scales between operculum or axil and hypural joint, and 7 between anterior dorsal and anal rays. Tr. 7 or 8. Predorsal 0. Head (13mm.) 3, depth (8) 5 in standard lenth (40).

Eye (4) 3.2, snout (3) and depth of caudal peduncle (3) 4.3 in head. Breadth (7) 1.1 in depth.

Head subconic, naked. Rows of papillae around chin and preoperculum, along interorbital, on sides of head and in scattered groups (resembling microscopic chimneys) on the naked vertex and nape to near spinous dorsal fin. Eyes very close together. Snout convex. Nostrils not far from eye, the anterior in a short, flap-like tube, the posterior a slightly raised opening. Mouth slightly oblique, mandible projecting a trifle, maxilla reaching below front of orbit. Bands of fine, subequal, backwardly directed teeth in jaws. Tongue truncate, free. Gill-openings extending well forward below, separated by narrow isthmus.

Body robust, subcylindrical in front, compressed behind. Scales large, deciduous, ctenoid with radii converging posteriorly. They extend over the breast, but not on nape, and not always on pectoral bases.

Caudal peduncle slightly more than twice as long as deep. Genital papilla large, probably finger-like in male and broad and leaf-shaped in females.

First dorsal origin slightly behind level of pectoral and ventral origins, the fin is elevated, reaching second dorsal when adpressed, seven-spined, with the fourth longest. Second dorsal and anal fins with the rays more or less than the depth of the body between them. Pectorals rounded reaching about 7th body-scale or to below notch between dorsal fins. Ventrals larger than pectoral, with broad infundibulum, and reaching genital papilla. Caudal rounded.

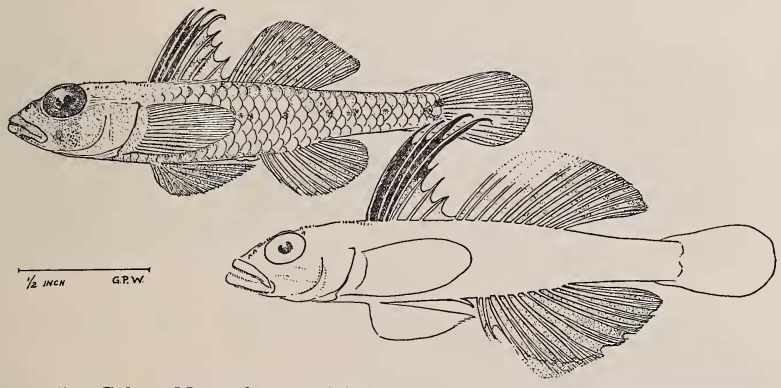

Figure 5.—Goby, *Nesogobius pulchellus*. Two Port Jackson specimens, Austr. Mus.

Colour, in alcohol, pale brown, finely punctulated with dark brown, punctae larger on snout and sides of head. About seven brown blotches along middle of side, with (behind the last) one above and one below on the scales before the caudal fin. First dorsal fin dark brown (perhaps blackish in life) anteriorly, becoming spotted and then white posteriorly. Soft dorsal yellowish with three or four irregular rows of rosettes of reddish-

brown dots and with a brown margin. Anal plain with narrow brown margin. Pectorals and ventrals yellowish, infuscated with brown. Caudal yellowish, plain. No vertical bars as in *hinsbyi*.

Described and figured from a specimen 40mm. in standard length or 2 inches overall, in comparison with smaller specimens.

Localities: Rose Bay, Port Jackson, New South Wales (described example, Austr. Mus., regd. no. I.9736); collected in 1908 by Messrs. Dene B. Fry and C. Ross. New record for New South Wales.

Port Jackson, 10th July, 1886; old collection (I.6750), four specimens; and another numbered I.9010.

Westernport, Victoria; six specimens collected by J. Gabriel in 1906 and in May, 1915 (Nos. I.7616 and IA.1319).

Genus MARS Jordan and Seale, 1906

Mars Jordan and Seale, Bull. U.S. Fish. Comm., xxv, 1905 (1906), pp. 382, 399 and 408. Orthotype, *M. strigilliceps* Jordan and Seale.

Id. Fowler, Mem. Bishop Mus., x, 1928, p. 414 (as subgenus of *Cryptocentrus*).

Id. Koumans ,Prelim. Rev. Gen. Gobioid Fishes, 1931, pp. 36 and 98.

Id. Herre, Copeia, 1933, i, 1933, p. 22.

Id. Herre, Fish Herre Exped., 1934, pp. 84 and 87.

Id. Herre, Journ. Pan-Pacif. Res. Inst., x, 2, 1935, p. 166.

Id. Herre, Philip Journ. Sci., lix, 1936, p. 363.

Id. Herre, Proc. Biol. Soc., Washington, lviii, 1945, pp. 12 and 79.

MARS STRIGILLICEPS Jordan and Seale

One specimen from Murray Island, Queensland (Austr. Mus., regd. no. I.11829), agrees in detail with Jordan and Seale's description (Bull. U.S. Bur. Fisher., xxv, 1905 (1906), p. 408, fig. 95), only differing in having no elevated spine in first dorsal fin, and no perceptible palatine teeth. This species is new to the Australian list.

Cryptocentrus octofasciatus Regan (Trans. Linn. Soc., London (2), xii, 1908, p. 241, pl. 29, fig. 2), from Chagos Archipelago and more especially as figured from Hiroshima by Tomiyama (Jap. Journ. Zool., vii, 1936, p. 80, fig. 30) looks very like my example, but has smaller scales and these extend over breast and belly and some at least are cycloid, whilst the suboperculum is said to be produced into a spine.

Genus STIGMATOGOBIUS Bleeker, 1874

Stigmatogobius Bleeker, Arch. Neerl. Sci. Nat., ix, 1874, pp. 298 and 323. Orthotype, *Gobius pleurostigma* Bleeker.

Id. Bleeker, Versl. Akad. Amsterd. (2), xii, 1878, pp. 199-208 (*fide* Weber and Beaufort, Fish. Indo-Austr. Archip., i, 1911, p. 376).

Id. Weber, Siboga Exped., lvii, 1931, Fische, p. 475.

I have not seen Bleeker's "Description des especes insulindiennes du genre Stigmatogobius" (*loc. cit,* 1878), so follow Koumans in placing *Gobius johnstoniensis* De Vis, MS. in the genus *Stigmatogobius*.

STIGMATOGOBIUS JOHNSTONIENSIS (Koumans)

(Figure 6)

Gobius johnstoniensis Koumans, Zool. Med., xxii, 1940, p. 166. *Ex* De Vis, MS. Johnston R., Queensland.

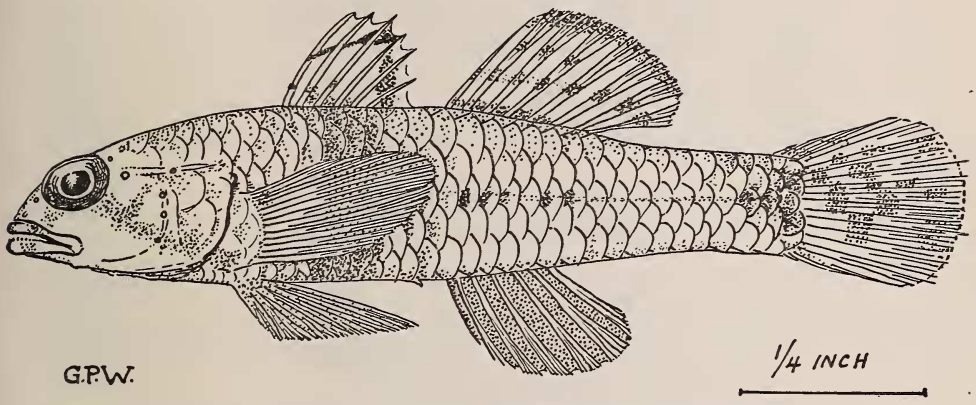

Figure 6.—Goby, *Stigmatogobius johnstoniensis.* Lectotype, Austr. Mus.

Here figured from the lectotype, being the largest of four cotypes in the Australian Museum, from the Johnstone River at "Geraldton," now Innisfail, north Queensland, Austr. Mus., regd. no. I.447.

Allied to *Vaimosa balteata* Herre (Field Mus. Publ., 335, Zool., xviii, 12, 1935, p. 419, and xxi, 1936, p. 359, fig. 21) from Waigiu.

Family ALEUTERIDAE

OSBECKIA SCRIPTA (Forster)

(Figure 7)

Balistes scriptus Forster, Voy. China (Osbeck), ii, 1771, Faunula Sinensis, p. 331. Based on Osbeck, 1765, a non-binomial translation of a pre-Linnean work. China and Bahamas.

Balistes laevis Bloch, 1795; *B. liturosus* Shaw, 1804; *B. ornatus* Proce, 1822; *Aluteres personatus* and *pareva* Lesson, 1830; and *Aluterus venosus* Hollard, 1854.

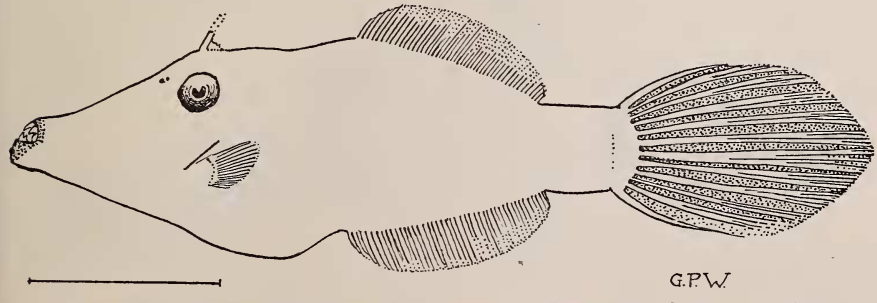

Figure 7.—Leatherjacket, *Osbeckia scripta.* Pleisotype of *Monacanthus macrurus — maculicauda,* Macleay Museum.

Monacanthus macrurus Macleay, Proc. Linn. Soc., N.S. Wales, vi, 1881, p. 330. Port Jackson, N.S. Wales. Name preocc. by Bleeker, 1856, now a *Pseudomonacanthus*.

Monacanthus maculicauda Ogilby, Cat. Fish. N.S. Wales, 1886, p. 64. New name for *M. macrurus* Macleay, preocc.

The Curator of the Macleay Museum kindly lent me a type of *M. macrurus* Macleay (non Bleeker) — *maculicauda* Ogilby for figuring here. The colour-markings have disappeared, but it proves to be a small *Osbeckia scripta*.

The West Indian congener should evidently be called *O. picturata* (Poey), because Poey (Proc. Acad. Nat. Sci., Philad., xv, 1863, p. 183) restricted Bloch's *laevis* to the East Indian species, now *scripta*.

Family SOLENICHTHYIDAE, nov.

Genus SOLENICHTHYS Bleeker, 1865

Solenostomus Lacepede, Hist. Nat. Poiss., v, 1803, p. 360. Haplotype, *Fistularia paradoxa* Pallas, Spicil. Zool., viii, 1770, p. 32, pl. iv, fig. 6, from Amboina. Preocc. by *Solenostomus* Meuschen, Index Zoophy. Gronow, 1781, *ex* Gronow, p. 119, no. 365, non-binomial, another genus of fishes equal to *Fistularia*. Spelt *Solenostoma* by some authors, but preocc. by Dumeril, 1805, equals *Fistularia*.

Solenichthys Bleeker, Ned. Tijdschr. Dierk., ii, 1865, p. 183. New name for *Solenostomus* Lac., preocc. Later emended to *Solenostomichthys* and *Solenostomatichthys* by Bleeker in 1873 and 1875 respectively.

There are nine nominal species: *Solenichthys armatus* (Weber, 1913), *S. bleekeri* (Dumeril, 1870), *S. brachyurus* (Bleeker, 1855), *S. cyanopterus* (Bleeker, 1855), *S. laciniatus* (Willey, 1909), *S. leptosomus* (Tanaka, 1908), *S. paegnius* (Jordan and Thompson, 1914), *S. paradoxus* (Pallas, 1770), and *S. phantasticus* (Herre, 1933). The new family name proposed above replaces Solenostomidae of authors, preoccupied.

SOLENICHTHYS LEPTOSOMUS (Tanaka)

(Figure 8)

Solenostomus leptosoma Tanaka, Annot. Zool. Jap., vi, 4, 1908, p. 29, fig. Sagami Sea, Japan. *Id.* Jordan and Thompson, Mem. Carneg. Mus., vi, 4, 1914, p. 236.

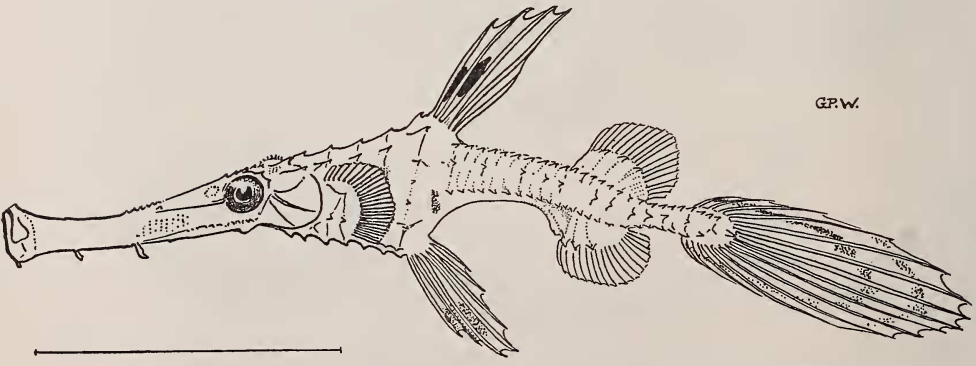

Figure 8.—Ghost Pipefish, *Solenichthys leptosomus*. A specimen from New South Wales.